CLAIMS:

1. A process for the catalytic cracking of a nitrogen-containing heavy hydrocarbonaceous feed to lighter products with reduced NO_x emissions, which process comprises:

a) cracking said feed by contacting said feed with a NO_x reducing catalyst system in a fluidized catalytic cracking (FCC) reaction zone operating at catalytic cracking conditions to produce a mixture of cracked products and spent cracking catalyst having nitrogen compounds and coke deposited thereon, wherein said catalyst system comprises (i) at least one solid acid component, (ii) at least one metal-containing component comprised of one or more elements from Groups 1 and 3, and one or more elements from Groups 4-15 of the Periodic Table of the Elements; and at least one of oxygen and sulfur, wherein the elements from Groups 1 and 3, Groups 4 – 15 and the at least one of oxygen and sulfur are chemically bound both within and between the groups and (iii) at least one support, filler or binder;

b) separating said cracked products from said spent cracking catalyst to produce a cracked product vapor phase stream, which is charged to a fractionation zone, and spent catalyst having nitrogen compounds and carbon deposited thereon, which spent catalyst is charged to a stripping zone;

c) stripping said spent catalyst of volatile compounds in said stripping zone to produce a stripped spent catalyst having coke and nitrogen compounds deposited thereon;

d) regenerating said stripped, spent catalyst with an oxygen-containing gas in a regeneration zone operated at partial CO combustion conditions effective for producing a regenerated catalyst and a flue gas stream containing

from about 0.5 to 4 vol. % CO and greater than about 90 ppm by volume, NO, wherein the content of NO_x in said flue gas stream is reduced; and

e) conducting said regenerated catalyst from the regeneration zone to the reaction zone.

2. The process of claim 1 wherein the solid acid component is in physical admixture with the metal-containing component.

3. The process of claim 1 wherein the solid acid component and the metal-base component are chemically bound.

4. The process of claim 2 wherein the solid acid component is at least one of one or more crystalline solid acids, one or more supported acids and mixtures thereof.

5. The process of claim 4 wherein oxygen is part with the metal-containing component.

6. The process of claim 1 wherein the one or more elements from Groups 1 and 3 are at least one of lithium, sodium, potassium, rubidium, cesium, francium, scandium, yttrium, lanthanum, cerium, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium.

7. The process of claim 1 wherein the one or more elements from Groups 4-15 are titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, boron, aluminum, phosphorous, gallium, germanium, zirconium, niobium,

molybdenum, ruthenium, rhodium, palladium, silver, indium, tin, antimony, hafnium, tungsten, rhenium, iridium, platinum, gold, lead and bismuth.

8. The process of claim 6 wherein the one or more elements from Groups 4-15 are titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, boron, aluminum, phosphorous, gallium, germanium, zirconium, niobium, molybdenum, ruthenium, rhodium, palladium, silver, indium, tin, antimony, hafnium, tungsten, rhenium, iridium, platinum, gold, lead and bismuth.

9. The process of claim 1 wherein the weight ratio of solid acid component to the total weight of metal-containing component is 1000:1 to 1:1000.

10. The process of claim 9 wherein the weight ratio of solid acid component to the total weight of metal-containing component is 500:1 to 1:500.

11. The process of claim 10 wherein the weight ratio of solid acid component to the total weight of metal-containing component is 100:1 to 1:100.

12. The process of claim 1 wherein the No_x reducing catalyst system comprises a cracking component.

13. The process of claim 12 wherein the cracking component comprises at least one of crystalline silicates, crystalline substituted silicates, crystalline aluminosilicates, crystalline substituted aluminosilicates, crystalline aluminophosphates, crystalline substituted aluminophosphates, zeolite-bound-zeolite, having 8- or greater-than-8 membered oxygen rings in framework structures.

14. The process of claim 12 wherein the cracking component of the NO_x reducing catalyst system is selected from the group consisting of a large-pore zeolite, a medium-pore zeolite, and mixtures thereof.

15. The process of claim 12 wherein the large-pore zeolite is a faujasite.

16. The process of claim 12 wherein the medium-pore zeolite is selected from the ZSM series.

17. The process of claim 15 wherein the medium-pore zeolite is selected from the group consisting of ZSM-5, ZSM-11, ZSM-12, ZSM-22, ZSM-23, ZSM-48, and ZSM-50.

18. The process of claim 1 wherein the solid acid component further comprises at least one support, filler, or binder.

19. The process of claim 1 wherein the metal-containing component further comprises at least one support, filler, or binder.

20. A process for the catalytic cracking of a nitrogen-containing heavy hydrocarbonaceous feed to lighter products with reduced NO_x emissions, which process comprises:

a) cracking said feed by contacting said feed with a NO_x reducing catalyst system in a fluidized catalytic cracking (FCC) reaction zone operating at catalytic cracking conditions to produce a mixture of cracked products and spent

cracking catalyst having nitrogen compounds and coke deposited thereon, wherein said catalyst system comprises (i) at least one solid acid component, (ii) at least one metal-containing component comprised of one or more elements from Groups 1 and 3, and one or more elements from Groups 4-15 of the Periodic Table of the Elements; and at least one of oxygen and sulfur, wherein the elements from Groups 1 and 3, Groups 4 – 15 and the at least one of oxygen and sulfur are chemically bound both within and between the groups and (iii) at least one support, filler, or binder;

b) separating said cracked products from said spent cracking catalyst to produce a cracked product vapor phase stream, which is charged to a fractionation zone, and spent catalyst having nitrogen compounds and carbon deposited thereon, which spent catalyst is charged to a stripping zone;

c) stripping said spent catalyst of volatile compounds in said stripping zone to produce a stripped spent catalyst having coke and nitrogen compounds deposited thereon;

d) regenerating said stripped, spent catalyst with an oxygen-containing gas in a regeneration zone operated at partial CO combustion conditions effective for producing a regenerated catalyst and a flue gas stream containing from about 0.5 to 1 vol. % CO and greater than about 263 ppm by volume, NO, wherein the content of NO_x in said flue gas stream is reduced; and

e) conducting said regenerated catalyst from the regeneration zone to the reaction zone.

21. The process of claim 20 wherein the solid acid component is in physical admixture with the metal-containing component.

22. The process of claim 20 wherein the solid acid component and the metal-base component are chemically bound.

23. The process of claim 21 wherein the solid acid component is at least one of one or more crystalline solid acids, one or more supported acids and mixtures thereof.

24. The process of claim 23 wherein oxygen is part with the metal-containing component.

25. The process of claim 20 wherein the one or more elements from Groups 1 and 3 are at least one of lithium, sodium, potassium, rubidium, cesium, francium, scandium, yttrium, lanthanum, cerium, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium.

26. The process of claim 20 wherein the one or more elements from Groups 4-15 are titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, boron, aluminum, phosphorous, gallium, germanium, zirconium, niobium, molybdenum, ruthenium, rhodium, palladium, silver, indium, tin, antimony, hafnium, tungsten, rhenium, iridium, platinum, gold, lead and bismuth.

27. The process of claim 25 wherein the one or more elements from Groups 4-15 are titanium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, boron, aluminum, phosphorous, gallium, germanium, zirconium, niobium, molybdenum, ruthenium, rhodium, palladium, silver, indium, tin, antimony, hafnium, tungsten, rhenium, iridium, platinum, gold, lead and bismuth.

28. The process of claim 20 wherein the weight ratio of solid acid component to the total weight of metal-containing component is 1000:1 to 1:1000.

29. The process of claim 28 wherein the weight ratio of solid acid component to the total weight of metal-containing component is 500:1 to 1:500.

30. The process of claim 29 wherein the weight ratio of solid acid component to the total weight of metal-containing component is 100:1 to 1:100.

31. The process of claim 20 wherein the No_x reducing catalyst system comprises a cracking component.

32. The process of claim 31 wherein the cracking component comprises at least one of crystalline silicates, crystalline substituted silicates, crystalline aluminosilicates, crystalline substituted aluminosilicates, crystalline aluminophosphates, crystalline substituted aluminophosphates, zeolite-bound-zeolite, having 8- or greater-than-8 membered oxygen rings in framework structures.

33. The process of claim 31 wherein the cracking component of the NO_x reducing catalyst system is selected from the group consisting of a large-pore zeolite, a medium-pore zeolite, and mixtures thereof.

34. The process of claim 32 wherein the large-pore zeolite is a faujasite.

35. The process of claim 32 wherein the medium-pore zeolite is selected from the ZSM series.

36. The process of claim 34 wherein the medium-pore zeolite is selected from the group consisting of ZSM-5, ZSM-11, ZSM-12, ZSM-22, ZSM-23, ZSM-48, and ZSM-50.

37. The process of claim 20 wherein the solid acid component further comprises at least one support, filler, or binder.

38. The process of claim 20 wherein the metal-containing component further comprises at least one support, filler, or binder.